

directions, differing much in their climatic qualities. On the other hand, Western and Southern Europe was marked by an atmospheric pressure persistently and greatly lower, with an absence of anything approaching a cyclone—usually a characteristic feature of the weather at this season—if we except a cyclone, not very decidedly marked, that appeared in the Bay of Biscay on February 25, and thence passed slowly eastwards across Italy and Greece, towards Asia Minor, which was reached on March 2.

The inevitable consequence of this distribution of atmospheric pressure was a prevalence of calms and of easterly and northerly winds over the Continent, with low temperatures. For five days, ending February 19, the anticyclone had its centre near Moscow, during which time the barometer, at 32° and sea-level, rose to 30·965 inches. Meanwhile temperature steadily fell, and -7°·6 was recorded at Moscow on the morning of the 19th. The anticyclone thence advanced northward to the White Sea and westward to the Gulf of Bothnia, a pressure of 30·961 inches being recorded at Haparanda on the 22nd, and 30·922 inches at Uleaborg, in Lapland, on the 24th; and thereafter southward to Stockholm with a pressure of 30·603 inches on the 28th, to Riga with a pressure of 30·742 inches on March 1, and to Charkow with a pressure of 30·398 inches on the 2nd. The central regions of the anticyclone were throughout, as happens at this season, marked by unusually low temperatures, the lowest being -16°·8 on the 23rd and -18°·8 on the 24th at Archangel, and -15°·5 on the following morning at Haparanda, these temperatures being about 30°·0 below the average for this time of the year at these places.

The weather-maps show that an important change had already set in on the morning of the last of February, the curvings of the isobaric lines pointing to a cyclone to the north-east of the White Sea, and to another cyclone advancing to the south-west of the British Islands. The anticyclone was thus now surrounded by three cyclones, located respectively near the White Sea, to the south-west of the British Islands, and in the Mediterranean. On the morning of March 1 the most northern of the cyclones had travelled somewhat westwards, and the other two to eastward; and these respective movements were continued on the following day. In the meantime the anticyclone had greatly shrunk in breadth, and by the morning of the 2nd, when the snowstorm raged most fiercely over an unusually extensive breadth of country, it lay as a narrow tongue of high pressure westwards over Scandinavia, and, meteorologically considered, perilously close on to the cyclone whose centre was then about the Humber. It necessarily followed, from the contiguity of the high-pressure area to the cyclone on its north side, that the storm passed across the British Islands with uncommon slowness, thus prolonging its continuance in Great Britain; and that the steepest gradients were formed in the north-east quarter of the cyclone,—a rather unusual feature of the storms of North-Western Europe,—thus exposing North Britain to one of the worst easterly gales of recent years.

Some snow fell in a few places on Sunday, but on Monday it fell in almost all parts of England, the fall being particularly severe in North Wales and the northern counties. The Furness and Wigtownshire railway lines were blocked and traffic suspended, a circumstance that has not occurred since these railways were opened, which as regards the Furness line is twenty-seven years ago. In the more southern counties the storm was not quite so severe, and as the day advanced the snow changed to sleet and at last to heavy rain. On the Tuesday the storm spread northwards over all Scotland, and raged with a fury altogether unexampled. Owing to the fineness of the snow-particles and the force of the wind, snowdrifts in many places accumulated in a degree quite unparalleled, and all transit was seriously

paralysed. The most serious railway block occurred on the East-Coast line, and it was computed that thirty trains of various sorts were snowed up between Newcastle and Berwick. Letters carried by the London Monday mail were not delivered in Edinburgh till Friday morning. The sensation produced by the rapidly-driven snow-particles on the face resembled the sharp pricking of a shower of needles; and it was remarked that the effect of the snow-drift on the eyes gave the feeling which would be produced by the spray of dilute nitric acid. As respects the singular character of the snowfall, it may be suggested that it was in some way connected with the remarkable meteorological conditions described above as having overspread Eastern and Northern Europe during the fortnight preceding the storm, and the proximity of North Britain to the anticyclone when the storm raged in all its fierceness.

It is remarkable that, while the snowfall was large in many western as well as in eastern districts, it was comparatively light over the higher midland parts of Scotland, and that on Ben Nevis and surrounding mountains little snow fell. It is to be noted, however, that at the Ben Nevis Observatory the wind blew, not as is usual on such occasions, from a different direction, but from precisely the same direction as at lower levels, with a force, however, very greatly diminished, the mean wind-force for the day being estimated by Mr. Omond at only 4 of the Beaufort scale. For the week preceding the storm the mean pressure and temperature of the air at the Observatory were respectively 25·482 inches and 14°·9; and at sea-level at Fort William, 30·154 inches and 33°·2. This mean pressure at the Observatory is 0·046 inch in excess of what previous observations show to be the mean when the sea-level pressure and temperature of the air is as above. On the morning of the storm the excess was double that of the previous week. It is these departures from the average in their relations to the cyclones and anticyclones of this part of Europe that give the Ben Nevis observations their great significance.

## NOTES

It will be remembered that the Paris Academy of Sciences on Monday week, after hearing Prof. Pasteur's account of the cases he has treated, appointed a Committee to consider the question of the establishment at Paris of a vast international hospital. On Monday last M. Vulpian communicated to the Academy the following proposals, unanimously agreed upon by the Committee:—(1) An establishment for the treatment of rabies shall be founded at Paris under the name of l'Institut Pasteur. (2) This Institution shall be open both to French subjects and to foreigners bitten by dogs or other rabid animals. (3) A public subscription is opened in France and abroad for the foundation of this establishment. (4) The employment of the funds subscribed shall be made under the direction of a Committee, consisting of Admiral Jurien de la Gravière, President of the Academy of Sciences; M. Bertrand, M. Vulpian, M. Marey, M. Paul Bert, M. Bichat, M. Charcot, M. Hervé Mangon, M. de Freycinet, M. Camille Doucet, M. Wallon, Vicomte Delaborde, M. Jules Simon; M. Magnin, Governor of the Bank of France; M. Christophile, Governor of the Crédit Foncier; M. Alphonse de Rothschild; M. Beclard, Doyen of the Faculty of Medicine, and Perpetual Secretary of the Academy of Medicine; M. Brouardel, Professor to the Faculty of Medicine, and President of the Consultative Hygienic Committee of France; M. Gaucher, Professor to the Faculty of Medicine of Paris. (5) The subscriptions shall be received at the Bank of France and its branches, at the Crédit Foncier and its branches, and at the Public Treasury Offices. The names of all subscribers shall be inserted in the *Journal Officiel*.

THE Stockport people have a pleasantly hearty way of testifying their appreciation of the services of scientific men. A series of popular science lectures has been given this winter under the auspices of the local Society of Naturalists and the directors of the Mechanics' Institution. The fourth of the series was on "The Life of Pasteur," and on the conclusion of the lecture it was proposed from the body of the hall that an address of thanks should be sent to the illustrious Frenchman. In accordance with the resolution an illuminated memorial has been prepared for transmission to M. Pasteur.

M. CHEVREUL has so far recovered that he has been able to walk out in spite of the low temperature prevailing in Paris.

SIR JOHN LUBBOCK has been appointed Rede Lecturer to the University of Cambridge for the ensuing year.

M. CORNU, member of the Paris Academy of Sciences and Professor in the Polytechnic School, has been appointed a member of the Bureau des Longitudes.

THE Council of the St. Petersburg University has awarded Prof. P. A. Tlienkov's premium of 500 roubles to Prof. P. T. Brounoff of the same University for his work on "The Laws of the Movement of Cyclones and Anticyclones, especially in Russia." For the next year's competition the same premium is offered for the best work on the Composite of European Russia.

THE late Dr. Davidson had a world-wide reputation as one of the most eminent of British palæontologists, and freely gave his life-long services for the advancement of science. He also rendered, for a series of years, great and valuable services to Brighton; chief amongst which may be mentioned the arrangement of the Brighton Free Museum in its present *locale*, the presentation to it of a fine series of volcanic products, and of his collection of rocks and fossils from the Paris Basin—one that is unique of its kind and of very great value because it was obtained whilst the fortifications of Paris were being constructed, an exceptional circumstance not likely to recur; in addition to these the late Dr. Davidson acted as Chairman of the Museum Committee for several years, and filled that office at the date of his death. Whilst holding this position his attention to and care over the best interests of that institution were unremitting, and he was always ready, at his own expense, to purchase specimens for the public benefit, whenever he thought it desirable to fill up gaps in any series in the museum, on behalf of which his scientific influence was always freely exercised. It is felt that such disinterested and valuable services should be permanently commemorated in the museum in which Dr. Davidson laboured so assiduously and which he loved so well. With this end in view, the Mayor of Brighton, Mr. E. J. Reeves, on behalf of the members of the Pavilion Committee of the Town Council, and of the Museum, Fine Arts, and Library Committees, invites his fellow-townsmen and Dr. Davidson's personal and scientific friends to contribute towards the raising of a fund to be devoted to the placing in the museum of a memorial to the late Dr. Davidson.

THE Royal Meteorological Society's Exhibition of Barometers will be held at the Institution of Civil Engineers, 25, Great George Street, Westminster, on Tuesday and Wednesday next. The Exhibition will be a most interesting one, as a large number of various forms of barometer have been brought together, many of them being of great value, and some being the only specimens known to exist. At the meeting of the Society on Wednesday evening, the President, Mr. W. Ellis, will give an historical account of the barometer. Any persons, not Fellows, wishing to visit the Exhibition or to attend the meeting, can obtain tickets on application to the Assistant Secretary, Mr. W. Marriott, 30, Great George Street, S. W.

OF the three colleges—Columbia, Harvard, and University of Pennsylvania—that received the benefit of the Tyndall Fund, Columbia has been the first to act, we learn from *Science*. Her trustees have recently drawn up a series of regulations in regard to the John Tyndall Fellowship. The Fellow, who is to be appointed on the recommendation of the President and Professors in the Scientific Department, must pursue a course of study and research in experimental physics for the term of one year, and he may be reappointed. The first incumbent of the Fellowship is Michael Pupin, who graduated at Columbia in 1883 with honours, and has since his graduation been studying mathematics and physics at Cambridge, England.

M. GUERULT, the well-known electrician and secretary of the *Lumière Électrique*, has died, at the age of forty, from consumption. He was well known in England, where he stayed during some years to learn engineering.

A VERY interesting entomological conference took place recently at Odessa; it was organised by the Zemstvos of nearly all the southern provinces of Russia. It appears from the reports read by the respective representatives, that nearly all the southern districts of Russia suffer more or less from different obnoxious insects and other animals, but principally from the Hessian fly and marmots. The latter are especially destructive to the corn-fields, and the Zemstvos found themselves compelled to encourage the extermination of the plague by offering a reward of from one to three kopeks (one to three farthings) for each animal killed. During the year 1885 alone the Zemstvo of Kherson thus paid over 100,000 roubles, this sum corresponding to 6,600,000 animals killed, while in 1883 over 2,000,000 of these animals had been killed.

MR. WESTWOOD OLIVER, with the assistance of Messrs. E. W. Maunder, F.R.A.S., W. F. Denning, F.R.A.S., T. E. Espin, F.R.A.S., A. Cowper Ranyard, F.R.A.S., T. Gwyn Elger, F.R.A.S., J. E. Gore, F.R.A.S., J. Rand Capron, F.R.A.S., Howard Grubb, F.R.S., F.R.A.S., W. S. Franks, F.R.A.S., T. W. Backhouse, F.R.A.S., and other well-known observers, has in preparation a practical manual of "Astronomical Work for Amateurs," the aim of which is to help the possessors of limited instrumental means to turn their attention to astronomical researches of real scientific utility, special attention being directed to the comparatively new fields of spectroscopy and celestial photography. The book will be published by Messrs. Longmans and Co. Mr. Oliver invites suggestions from practical workers, which may be sent to him at Lochwinnoch, Scotland.

WE have received Parts I. and II. of "British Petrography, a Description of the Ordinary Rocks of the British Isles," by J. J. Harris Teall, F.G.S. The publishers are Watson Brothers and Douglas, Birmingham.

ON March 15, 22, and 29, Prof. Bonney lectures at the London Institution on the "Making of Mountains."

THE Arago Laboratory created by M. de Lacaze-Duthiers in France is attracting much attention on the Continent. This laboratory serves as a counterpart to that formed at Roscoff, and is performing an excellent work. It is constructed in such a manner as to be capable of resisting excessive heat, which always militates considerably against the operations carried on at this and all similar laboratories.

THE artificial reproduction of the sole is being energetically carried on in France, where a laboratory was established so far back as 1881 by Dr. Jousset of Belleyne especially for this purpose. Since that time the ova of the sole have been regularly incubated with success, notwithstanding the numerous difficulties attending the process.



THE French Consulting Committee of Hygiene recently advised the prohibition of the use of vaseline for butter in food preparations. The effects of vaseline on the system, however, seemed to require fuller examination, and Dr. Dubois has made some experiments in regard to it. Two dogs were fed exclusively on soup in which the usual fat was entirely replaced with vaseline; one of them absorbed 25 grammes of vaseline a day for ten days, the other 15 grammes (this would correspond in the case of an average man to 100 grammes and 60 grammes respectively). With this diet the animals even slightly increased in weight. Their general state was good: there was no loss of appetite, nor vomiting, nor diarrhoea. In general it may be said that the carburets of hydrogen forming vaseline, though they favour neither oxidation nor saponification like fats, are readily tolerated in the alimentary canal, at least in the case of dogs. Further experiments will show if a prolonged use of the substance is equally innocuous.

It is estimated by the Marquis de Nadaillac (*La Nature*), that Europeans can endure temperatures as widely apart as 130° C. at least. Thus, on January 25, 1882, a temperature of -65° C. was recorded on board the *Varna* and *Dijnphna*, when blocked by ice in the Sea of Kara, east of the Straits of Waigatz. On the other hand, M. Duveyrier, in the country of the Touaregs, in Central Africa, has seen the thermometer rise to 67°·7 C.

A RECENT number of *Globus* contains an article by Prof. Nehring, on an interesting prehistoric discovery made in the neighbourhood of Madgeburg. At the village of Westeregeln, between that city and Halberstadt, in the course of some work the labourers came on the remains of an ancient grave, containing parts of the skeleton of an unburned human body, near which were about 112 bored dogs' teeth, two decorated shells of a river shell-fish now only found in Southern Europe, the *Unio sinuatus*: two pieces of an easily-burnt resin, the remains of one or more clay vessels, and a small highly-oxidised bronze ring, which appears to have been used as a finger ornament. The teeth, from their formation, must have been collected from twenty dogs; at least, and they were all bored through the root portion, and were evidently meant to be hung on a string. With reference to the shell, it is noticeable that here and there in the Rhine provinces similar shells are found with Roman remains. Dr. Nehring is inclined to look for an explanation of this circumstance rather to an importation from Southern Europe than to the theory that the *Unio sinuatus* has died out since the Roman period in the Rhine provinces. Ornaments of the teeth of Carnivora for the neck, waist, arms, &c., have been found in prehistoric mounds or graves elsewhere in Germany; and even now they are in use for a similar purpose amongst certain primitive peoples. The Igorrotos of Luzon use them for necklets and earrings; so also do the inhabitants of the islands in Torres Straits.

AT the annual meeting of the London Sanitary Protection Association the Report stated that the number of members is now over 1000, and the total number of inspections made during the year 1264; a large number having been made in the suburbs of London and several in the country, including that of Eton College and other large public institutions. Unfortunately the general character of the houses inspected was as insanitary as ever, only 5 per cent. being found in perfect order, and 9·5 per cent. in fairly good order; whilst in 60 per cent. foul air was escaping directly into the house, and in 24 per cent. sewage was partly retained underground by leakage or choking of pipes.

DR. SCHLIEMANN, who has been busy at Berlin for the last few days arranging in the new Ethnological Museum the fruits of his recent excavations, intends to return to Athens shortly.

The doctor promises that Berlin shall be the ultimate inheritor of all his archaeological treasures.

A TELEGRAM from Catania announces Mount Etna to be in a state of eruption. Cinders and stones are being continually thrown up, and it is supposed that lava is coming out of the crater, but as it is covered by a dense mist no proper observations can be taken. Slight shocks of earthquake have been felt at the foot of the mountain.

A VIOLENT shock of earthquake was felt at 7.30 on Saturday morning at Cosenza. Several houses were thrown down. One person was killed.

THE additions to the Zoological Society's Gardens during the past week include a Patas Monkey (*Cercopithecus patas* ♀) from West Africa, presented by Master Eric Blind; a Toque Monkey (*Macacus pileatus*) from Ceylon, presented by Mr. C. Brown; a Blue and Yellow Macaw (*Ara ararauna*) from South America, presented by Lieut. W. H. Duffin, King's Own Regiment; a Serval (*Felis serval* ♂), a White-tailed Ichneumon (*Herpestes albicauda*) from West Africa, presented by Mr. F. J. Jackson; a Canada Goose (*Bernicla canadensis*) from Canada, presented by Mr. J. E. Kelsall; a Rough-billed Pelican (*Pelecanus trachyrhynchus*) from Mexico, a Hutchins's Goose (*Bernicla hutchinsii*), from Arctic America, purchased.

#### OUR ASTRONOMICAL COLUMN

LUNAR INEQUALITIES DUE TO THE ACTION OF JUPITER. —Some years ago Prof. Newcomb, discussing certain discordances between the observed and tabular places of the moon, was led to the conclusion that there existed a hitherto undetected inequality with a coefficient of 1"·5 in the longitude, and having a period of about 17 years as regards its effects on the eccentricity and longitude of the perigee. Shortly afterwards Mr. Neison announced that he had found in the action of Jupiter the explanation of this inequality. Using Delaunay's notation, his expression for the inequalities in longitude is—

$$\delta V = -1''\cdot163 \sin(2h + 2g + l - 2h'' - 2g'' - 2l'') \\ + 2''\cdot200 \sin(2h + 2g - 2h'' - 2g'' - 2l'').$$

Now, the coefficient of the second of these inequalities is, theoretically, a quantity one order higher than that of the first; the first having the simple power of the eccentricity as factor, while the second has the square. Hence we should naturally expect to find the latter coefficient the smaller. On the grounds, therefore, that there is reason to think that Mr. Neison's value of this coefficient is possibly too large, Mr. G. W. Hill has investigated the lunar inequalities arising from the action of Jupiter, and has computed afresh the values of the coefficients of the resulting perturbations in longitude. His final result is—

$$\delta V = -0''\cdot903 \sin(2h + 2g + l - 2h'' - 2g'' - 2l'') \\ + 0''\cdot209 \sin(2h + 2g - 2h'' - 2g'' - 2l'') \\ - 0''\cdot118 \sin(l - 2h' - 2g' - 2l' + 2h'' + 2g'' + 2l'').$$

It will be seen that the coefficient of the second term is only about one-tenth of that found by Mr. Neison. It is not possible at present to determine the cause of this discordance, as Mr. Neison has not published the details of his investigation. It is to be hoped that he will now do so, in order to afford the means of deciding this interesting matter.

SPECTROSCOPIC DETERMINATION OF THE MOTION OF THE SOLAR SYSTEM IN SPACE. —The *Astronomische Nachrichten*, No. 2714, contains a brief note by Herr Hans Homann, giving the result of a discussion he has recently made of the spectroscopic observations of the motions of stars in the line of sight made at the Royal Observatory, Greenwich. He finds the position of the apex of the solar motion as derived from these to be R.A. 320°·1, Decl. 41°·2 N., and the speed of translation to be 39·3 ± 4·3 kilometres per second. He has likewise discussed the similar observations made by Dr. Huggins, and at the Temple Observatory, Rugby, by Mr. Seabroke, although these two latter series embraced too few stars, and these insufficiently observed to furnish adequate grounds for any satisfactory conclusions. The results derived from these three series, though differing very considerably from each other, yet show a certain rough correspondence which was perhaps all that could be expected,